What is Claimed:

1. A Coriolis flowmeter for measuring a process material flow having an ultra high level of purity, said Coriolis flowmeter comprising:

a base;

flow tube means adapted to receive said process material flow, said flow tube means is formed of a material that does not transfer ions from said flow tube means to said process material;

end portions of said flow tube means are coupled to said base to create substantially stationary nodes at said end portions;

a driver coupled to said flow tube means for vibrating said flow tube means containing said process material flow;

pickoff means coupled signalwise to said flow tube means for generating signals representing induced Coriolis deflections of said vibrating process material filled flow tube means; and

meter electronics that receives said signals from said pickoff means and generates output information pertaining to said process material flow.

2. The Coriolis flowmeter of claim 1 characterized in that said driver vibrates said flow tube means containing said process material.

3. The Coriolis flowmeter of claim1 characterized in that the entirety of the wetted flow path of said Coriolis flowmeter comprises a PFA substance.

4. The Coriolis flowmeter of claim 1 characterized in that said flow tube means is formed of a PFA substance to maintain said process material free from contamination due to ion transfer from said flow tube means to said process material.

5. The Coriolis flowmeter of claim 1 characterized in that said pickoff means is an electro-magnetic device having a magnet connected to said flow tube means and a coil.

6. The Coriolis flowmeter of claim 1 characterized in that said pickoff means comprises a light source and an optical detector;

said vibrating flow tube means is positioned between said light source and said optical detector to alter the characteristics of the light received by said optical detector from said light source,

said optical detector is responsive to said alteration to generate said signals representing said Coriolis deflections.

7. The Coriolis flowmeter of claim 1 characterized in that said base has a lower surface and an inner pair of upwardly extending side walls and also has an outer pair of upwardly ending walls;

openings in each of said upwardly extending walls coaxially aligned to receive said flow tube means.

8. The Coriolis flowmeter of claim 1 characterized in that said base is u-shaped and has a lower surface and a pair of upwardly extending side walls;

openings in each of said upwardly extending walls coaxially aligned to receive said flow tube means.

9. The Coriolis flowmeter of claim 1 characterized in that ends of said flow tube means extend beyond said side walls.

10. The Coriolis flowmeter of claim 1 characterized in that said base is a solid rectangular element defining a parallelepiped;

said flow tube means is connected to posts affixed to a top surface of said base.

11. The Coriolis flowmeter of claim 1 characterized in that:

an inlet of said flow tube means receives said process material flow from a supply tube;

an outlet of said flow tube means is coupled to an inlet of a return tube;

said return tube is coupled to said base and is positioned parallel to said flow tube means and extends through walls of said base, and

an exit tube is connected to an outlet end of said return tube to extend said process material flow towards a user application.

12. The Coriolis flowmeter of claim 1 characterized in that said flow tube means comprises a single flow tube and that said base has a mass substantially greater than the mass of said flow tube with process material.

13. The Coriolis flowmeter of claim 12 characterized in that the mass of said base is at least 1000 times the mass of said single flow tube with process material.

14. The Coriolis flowmeter of claim 12 characterized in that the mass of said base is at least 100 times the mass of said single flow tube with process material.

15. The Coriolis flowmeter of claim 12 in which said driver is affixed to the top of said single flow tube when in use.

16. The Coriolis flowmeter of claim 12 further comprising:

a dynamic balancer means coupled to said base proximate said nodes to maintain said nodes at a reduced level of vibration.

17. The Coriolis flowmeter of claim 16 characterized in that said dynamic balancer means is an active dynamic balancer controlled by the exchange of signals with said meter electronics.

18. The Coriolis flowmeter of claim 1 characterized in that said base is u-shaped and has a lower surface and a pair of upwardly extending side walls containing coaxially aligned openings for receiving said single flow tube.

19. The Coriolis flowmeter of claim 12 characterized in that said single flow tube extends through coaxial holes in said walls with ends of said single flow tube extending beyond said side walls.

20. The Coriolis flowmeter of claim 1 characterized in that said flow tube means comprises a first and a second flow tube coupled to said base and positioned parallel to each other, said first and second flow tubes are adapted to be vibrated in phase opposition by said driver.

21. The Coriolis flowmeter of claim 12.0 further comprising:
said driver is affixed to both said first flow tube and said second flow tube and is adapted to vibrate said first and second flow tubes in phase opposition; said pickoffs being affixed to both said first and second flow tubes to detect the Coriolis deflections of said first and second flow tubes.

22. The Coriolis flowmeter of claim 20 characterized in that said first and second flow tubes are connected in series with respect to said material flow.

23. The Coriolis flowmeter of claim 20 characterized in that said first and second flow tubes are connected in parallel with respect to said material flow.

24. The Coriolis flowmeter of claim 20 further comprising:
a return tube coupled to said base oriented parallel to said first and second flow tubes;

said return tube receives said process material flow from said first and second flow tubes and extends said material flow towards a user application.

25. The Coriolis flowmeter of claim 20 characterized in that:
said base is u-shaped and has upwardly extending walls;

said first and second flow tubes extend through said walls of said base and have inlet and outlet ends projecting beyond the outer surfaces of said walls.

26. A Coriolis flowmeter for measuring a flow of process material having an ultra high level of purity; said Coriolis flowmeter comprising:

a single flow tube formed of a material that does not transfer ions from said single flow tube to said process material;

a massive base affixed to ends of said single flow tube to reduce undesired vibrations by creating stationary nodes at said ends;

an inlet connector connected to said massive base and adapted to receive a flow of said process material from a supply tube;

an inlet of said single flow tube is affixed to said inlet connector, said input connector sealably connects said inlet of said single flow tube to an outlet of said supply tube to effect the extension of said process material flow in said supply tube to said single flow tube ;

a first set screw in said inlet connector maintains said inlet connector fixed with respect to said massive base;

a driver affixed to said single flow tube for vibrating said single flow tube containing said process material flow;

an outlet of said single flow tube affixed to a second connector for extending said process material flow via an exit tube towards a user destination;

a pair of pickoffs coupled to said single flow tube on opposite sides of said driver for generating signals representing Coriolis induced deflections of said vibrating material filled single flow tube; and

meter electronics;

conductors extending from said pickoffs to said meter electronics for extending said pickoff signals to said meter electronics;

said meter electronics receives said pickoff output signals and generates output information pertaining to said process material flow.

27. The Coriolis flowmeter of claim 26 further comprising;

a return tube connected to said massive base parallel to said single flow tube ;

end portions of said single flow tube and said return tube are glued to said massive base to maintain said single flow tube and said return tube immovable with respect to said massive base;

an inlet of said return tube;

an intermediate tube connecting said outlet of said single flow tube and said inlet of said return tube via said second connector to extend said process material flow from outlet of said single flow tube to said return tube;

an outlet connector connected to said massive base for receiving said flow of said process material from an outlet of said return tube;

said outlet of said return tube is affixed to said outlet connector, said outlet connector sealably connects said outlet of said return tube to an inlet of an exit tube to effect the extension of said process material flow in said return tube to said exit tube ;

a second set screw in said outlet connector maintains said outlet connector fixed with respect to said base;

said exit tube is adapted to extend said process material flow to a user destination.

28. The Coriolis flowmeter of claim 26 characterized in that said pickoffs are electro-magnetic devices each having a magnet and a coil.

29. The Coriolis flowmeter of claim 26 characterized in that said pickoffs each comprises a light source and an optical detector with the magnitude of the Coriolis deflection of said single flow tube defining the magnitude of the output current of said optical detector.

30. The Coriolis flowmeter of claim 26 characterized in that said massive base has a pair of upwardly extending parallel side walls having coaxial openings through which said single flow tube and said return tube extend.

31. The Coriolis flowmeter of claim 30 characterized in that said massive base is u-shaped.

32. The Coriolis flowmeter of claim 26 characterized in that said massive base is a solid rectangular element defining a parallelepiped;

said single flow tube is mounted to upwardly extending posts affixed to a surface of said massive base.

33. The Coriolis flowmeter of claim 30 in which ends of said single flow tube and said return tube extend beyond the outer surface of each leg.

34. The Coriolis flowmeter of claim 26 characterized in that said flow tube means comprises a single flow tube mounted to said massive base to define a dynamically unbalanced structure when vibrated by said driver.

35. The Coriolis flowmeter of claim 26 comprising a second flow tube coupled to said massive base to define a dynamically balanced structure when vibrated by said driver while containing said process material.

36. The Coriolis flowmeter of claim 26 characterized in that said driver is positioned when in use on a top surface of said single flow tube.

37. The Coriolis flowmeter of claim 26 further comprising:

a dynamic balancer means coupled to said massive base proximate said nodes to to reduce the vibration of said nodes.

38. The Coriolis flowmeter of claim 37 characterized in that said dynamic balancer means is an active dynamic balancer controlled by the exchange of signals with said meter electronics.

39. The Coriolis flowmeter of claim 26 characterized in that the entirety of the wetted flow path of said Coriolis flowmeter comprises a PFA substance.

40. The Coriolis flowmeter of claim 26 characterized in that said single flow tube is formed of a PFA substance to maintain said process material flow free from contamination due to ion transfer from said single flow tube to said process material.

41. The Coriolis flowmeter of claim 26 characterized in that the mass of said massive base is at least 1000 times the mass of said single flow tube.

42. The Coriolis flowmeter of claim 26 characterized in that said driver vibrates said flow tube at a resonant frequency of said material filled flow tube.

43. The Coriolis flowmeter of claim 26 characterized in that said driver vibrates said flow tube at a non resonant frequency of said material filled flow tube.

44. The Coriolis flowmeter of claim 40 characterized in that said Coriolis flowmeter is adapted to extend a flow of corrosive material including nitric acid.